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INFORMATION TECHNOLOGY IN HIGHER EDUCATION ADMINISTRATION

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ينطلق البحث من المقولة الداروينية حول العلاقة الوثيقة بين الإستمرار والقدرة على التكيف مع التغيير ليظهر أولوية التعامل مع تكنولوجيا المعلومات من قبل إدارات التعليم العالي بغية تحسين آليات العمل واتخاذ القرار، والتمكّن من المنافسة. ويبدأ بعرض التطور التاريخي لدور هذه التكنولوجيا ضمن الجامعات، وتوسّعها تدريجياً ضمن النطاق الإداري لدرجة أنّها أحدثت ثورة في أساليب التنظيم المؤسّساتي المعتمد منذ عشرات السنين، ثم يعدّد الإستخدامات المختلفة لتكنولوجيا المعلومات ضمن التعليم العالي عبر المقرّرات الدراسية والشبكات الداخلية والعالمية وتنظيم الموارد.

ويخلص البحث إلى بعض التوصيات المستقبلية الموجهة إلى الإداريين بهدف اتخاذ قرارات حذرة وفعّالة لإدماج التكنولوجيا في عمل مؤسّساتهم.

“It is not the strongest of the species who survive, nor the most intelligent, but the ones most responsive to change”. -- Darwin

Higher education has evolved rather slowly for most of the past century and tends to be resilient to many forces of change that generally

impact other types of enterprises. However, the Information Technology (IT) evolution of the recent decades has compelled many institutions of higher learning to reconsider many of their traditional practices, which range from the way they conduct day-to-day business to the process of making strategic decisions.

In this context, Darwin's statement is relevant in two important areas that we must emphasize: The first is obviously the importance of realizing the need to change and to respond in a timely manner. However, the second and more fundamental point is the implied nature of competition that institutions encounter and have to overcome in order to "survive" and to sustain their viability.

While societies rip the benefits of the information age, we generally find higher education trailing far behind in the effective application of multimedia and information technology in administration.

The complexity of managing educational institutions and accessing information has grown tremendously, as academic institutions become more like businesses, and administrators demand the detailed reports needed to make informed decisions. Administrative and academic information, traditionally maintained in independent systems, must be merged or linked in order to generate meaningful reports based on comparative analysis and synthesis of data.

BACKGROUND

Early deployment of information technology in academia concentrated in two main areas: academic and administrative. Accordingly, academic computer centers/services were established to cater to the computing needs of the academic branch of a campus. This operation consisted primarily of maintaining mainframe systems and a few terminal-equipped laboratories that operated off those systems. And, in most cases, academic departments maintained their own systems that supported the research needs of the academic community. On the administrative side, most institutions set up an administrative computing office that was organizationally situated within the business/finance division of the administration. The primary role of such an office was to operate and to maintain legacy information systems that facilitated important business processes such as management of student records and payroll. Back then, networking was mainly limited to a connection of the main academic computer system to the Internet and the

availability of departmentally-based and Local Area Networks (LANs), which were often autonomous and locally managed.

The computing support model of the nineteen-eighties (80's) and early nineties (90's) shifted to centralized computing services, whereby academic and administrative computing services were integrated into an office of information technology of some sort. In the meantime, campus networks evolved and became more prominent in the overall campus IT infrastructure. The new organizational model along with the increasing dependence on IT and its high cost helped the emergence of the Chief Information Officer (CIO) position at a relatively high level in the organization of an administration.

Later in the 90's, the focus shifted back to distributed services (i.e., the separation of academic and administrative computing). In the late 90's, learning management systems were introduced to and rapidly deployed at many higher education institutions. Campus networking exploded in scope and scale linking all types of computing systems (e.g., servers, printers, scanners, data warehouses, multimedia studios, publishing outlets, etc.) and offering an indispensable medium for conducting internal and external transactions, for delivering educational materials to students at remote locations, and for facilitating collaborations amongst peer researchers worldwide.

For many, IT has not only evolved but it is also revolutionizing the basic principles based on which academic institutions have existed and operated for centuries.

INFORMATION TECHNOLOGY ISSUES AND STRATEGIC VIEWPOINTS IN HIGHER EDUCATION

Information technology has become more ubiquitous in higher education than many people realize. Additionally, a large suite of tools and technologies are now enablers in addressing many challenges in managing colleges and universities. Consequently, an institution's administration must now consider and deal with many emerging technologies and issues related to IT which include:

1. Course Management Systems

Course Management Systems (CMS) offer faculty members a useful vehicle for delivering educational materials as a primary form of teaching or as a supplement to the traditional face-to-face instruction. Deploying CMS technology can be a costly investment, especially if the choice is either Blackboard or WebCT, which are also inflexible and unstable and lack user-friendliness. However and fortunately, more affordable and attractive alternatives, which include products from eCollege, Angel, and Desire2Learn, are available.

2. Security and Privacy

The issue of systems and data security is becoming increasingly crucial and requires a delicate balance between openness and protection. Academic environments, which promote free thinking and experimentation in the interest of discovery, are generally reluctant to trade their openness and render their e-learning environment a cyber fortress. In either case, institutions must still deal with some of the main challenges which include denial of service, viruses and worms, and dealing with security breaches.

3. Portal Technologies and e-Services

The pervasiveness of Web technology and the proliferation of information systems offering essential services ranging from student admissions and registration to e-procurement and management of alumni giving have resulted in a series of Web portals that offer each individual user a dynamic and customized window into a university's Web content. Therefore, it is highly desirable

- To integrate administrative systems and to provide a single sign-on to all; and
- To develop interoperability between systems and to clarify roles and responsibilities in order to determine who can access what systems.

4. Wireless Access and Networking Technologies

The reality of today's life styles (i.e., people on-the-go and need for instantaneous access to services and data at all times and from almost everywhere) require institutions to be more agile and to provide students, faculty, and staff with wireless access to the campus network, computing

resources, and information services. Fortunately, issues with security and authentication and network bandwidth are manageable and do not pose any great challenge to the IT management staff.

5. Funding and Infrastructure Replacement

It is evident that providing a viable IT infrastructure and services can be very costly. Actual costs can vary depending on the stage of development of the IT infrastructure. Some of the less thought of aspects is the cost of infrastructure replacement which must be planned for and executed periodically and in a reasonable cycle. However, once the infrastructure matures, it is typical to allot about 10% of the institution's budget for IT.

6. Enterprise Resource Planning

The deployment of Enterprise Resource Planning (ERP) systems is a relatively new phenomenon in higher education that has infiltrated the academy from the corporate world. The concept is essentially the melding of student records, payroll, financial, human resources, and other information into a complex, integrated system that is capable of providing cross-data and cross-function analysis and assessment for all user constituents and at all times.

This new model appeals, at least conceptually, to many leaders in higher education; however, the difficulties in data integration and ease-of-use along with the high costs associated with this method for data management calls for a careful approach as the ERP technology matures.

RECOMMENDATION FOR POSSIBLE SOLUTIONS

The academic world in general and higher education in particular continue to struggle with information technology due to several factors which include the high cost of deploying new (but needed) technologies, the relatively rapid emergence of new technologies, and the shortage and cost of technical expertise. Furthermore, a campus can no longer clearly separate the academic from administrative IT infrastructures and services since the dividing line has been blurred by the evolution of networking technology and the integration of systems in the interest of providing more uniform services to all campus constituents.

Therefore, it is imperative that concerned administrators be prudent in their decision making and in investing in all IT-related initiatives.

Accordingly, the following list offers a set of recommendations and guidelines that may be applicable to some situations :

- Embrace the concept of integrated portals to bring multiple applications and tools and technologies together to the user. However, at the same time, the university must address the underlying business processes and policies associated with them in order to become more effective and efficient.
- Seek to provide self-services to students and employees using Web-based applications in order to automate workflow and digital signatures, and to move from paper-based processes to automated processes.
- A campus should consider a scalable model to ensure that students coming to the university receive the support that they need. The new model should be inspired by multiple factors: (1) The recognition that you must re-engineer business processes from different aspects, (2) IT is a critical enabler for a new way of doing business, and (3) people need to have tools accessible to them at their place of work, e.g., on their desktops.
- In the area of security, employees should have access only to the information that is appropriate to the role they are fulfilling within their faculty or university. Additionally, checks and measures must be implemented to reflect institutional guidelines, policies and procedures.
- By consolidating separate and scattered databanks in a central repository of information, a campus can achieve enormous efficiency and higher data quality.

Finally, in the area of information systems, major IT vendors, such as PeopleSoft and SCT corporations, now offer a suite of campus solutions for many of the issues and challenges discussed earlier. The suite covers areas such as :

- Student recruitment and admissions
- Academic advisement
- Student registration
- Financial aide

- Personal portfolio
- Human resource management
- Financial record management
- E-Procurement
- Management of donations and alumni giving

Institutions, especially large ones, may have to opt to enterprise-wide solutions which are offered by commercial vendors instead of relying on fragmented, often un-interoperable systems that lack comprehensiveness, reliability, and scalability.

THE FUTURE

The information technology evolution will continue to accelerate and will erode usual constraints of space and time, thereby, transforming institutional barriers. According to industry leaders, in the distant future, IT could drive a convergence of higher education with IT-intensive sectors such as publishing, entertainment, and telecommunications creating a global knowledge and learning industry.

During a time of rapid technological changes, procrastination and inaction are dangerous courses for higher education. On the other hand, institutions need to avoid making hasty responses to current trends, especially at times when institutions are facing severe budgetary constraints while having to address competing priorities.

CONCLUSION

In summary, IT is no longer a privileged luxury but an essential necessity for every institution of higher learning. Without effectively deploying IT, the institution's viability, competitiveness, and, to a certain extent, future are at stake. For this and other important reasons, higher education must not lag behind other types of organizations, such as corporations and government institutions, and should be at the forefront in infusing emerging technologies in all aspects of teaching, research, and administration.

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